Algebra 1

Common to both Cores (based on new core language)	New Core Only	Old Core Only
Standard I: Students will expand number sense to understand, perform operations, and solve problems with real numbers. **Objective 1: Represent real numbers as points on the number line and distinguish rational numbers from irrational numbers.** • Define a rational number as a point on the number line that can be expressed as the ratio of two integers, and points that cannot be so expressed as irrational. • Classify numbers as rational or irrational, knowing that rational numbers can be expressed as terminating or repeating decimals and irrational numbers can be expressed as non-terminating, non-repeating decimals. • Classify *pi* and square roots of non-perfect square numbers as irrational. • Place rational and irrational numbers on a number line between two integers.		• Compare and order real numbers
Objective 2: Compute fluently and make reasonable estimates with rational and irrational numbers. • Simplify, add, subtract, multiply, and divide expressions with square roots. • Evaluate and simplify numerical expressions containing rational numbers and square roots using the order of operations. • Compute solutions to problems, represent answers in exact form, and determine the reasonableness of answers. • Calculate the measures of the sides of a right triangle using the Pythagorean Theorem.		• Relate properties and operations of rational numbers to irrational numbers • Choose appropriate and convenient forms of real numbers for solving problems and representing answers.

Standard II: Students will extend concepts of proportion to represent and analyze linear relations. **Objective 1: Represent and analyze the slope of a line.** • Identify the slope of a line when given points, a graph, or an equation. • Identify horizontal and vertical lines given the equations or slopes. • Determine the effect of changes in slope or *y*-intercept in $y = mx + b$. • Determine and explain the meaning of slopes and intercepts using real-world examples.		
Objective 2: Model and interpret problems having a constant rate of change using linear functions. • Write algebraic expressions or equations to generalize visual patterns, numerical patterns, relations, data sets, or scatter plots. • Represent linear equations in slope-intercept form, $y = mx + b$, and standard form, $Ax + By = C$. • Distinguish between linear and non-linear functions by examining a table, equation, or graph. • Interpret the slope of a linear function as a rate of change in real-world situations.		
Objective 3: Represent and analyze linear relationships using algebraic equations, expressions, and graphs. • Write the equation of a line when given two points or the slope and a point on the line. • Approximate the equation of a line given the graph of a line. • Identify the *x*- and *y*-intercepts from an equation or graph of a line. • Graph linear relations and inequalities by	• Identify the *x*- and *y*-intercepts from a table of values.	• Identify the domain and range of a relation or function from a graph, equation, table or set of ordered pairs • Determine whether two lines are parallel, perpendicular, or neither, given the equations • Use direct variation

plotting points, by finding x- and y-intercepts, or by using the slope and any point on the line.		
Standard III: Students will develop fluency with the language and operations of algebra to analyze and represent relationships. **Objective 1: Simplify polynomials and the quotient of monomials.** • Multiply monomials by a polynomial. • Multiply binomials. • Simplify the quotient of monomials using positive exponents.	• Simplify and evaluate monomial expressions and formulas. • Add and subtract polynomials.	
Objective 2: Solve and interpret linear equations and inequalities in various situations including real-world problems. • Solve single-variable linear equations and inequalities algebraically and graphically. • Solve real-world problems involving constant rates of change. • Solve equations for a specified variable. • Solve proportions that include algebraic first-degree expressions.		
Objective 3: Solve and interpret pairs of linear equations and inequalities. • Solve systems of two linear equations graphically and algebraically with and without technology. • Determine the number of possible solutions for a system of two linear equations. • Graph a system of linear inequalities and identify the solution.		• Solve systems of two linear equations or inequalities numerically, e.g., from a table or guess and check.
Objective 4: Factor polynomials with common monomial factors and factor simple quadratic expressions. • Find the greatest common monomial factor of a polynomial. • Factor trinomials with integer coefficients of the form $x^2 + bx + c$. • Factor the difference of two squares and		

perfect square trinomials.		
	Objective 5: Solve quadratic equations using factoring or by taking square roots. • Solve quadratic equations that can be simplified to the form $x^2 = a$ where $a \geq 0$ by taking square roots. • Solve quadratic equations using factoring. • Write a quadratic equation when given the solutions.	
Geometry & Measurement		• Solve problems using the distance and midpoint formulas (Geometry) • Solve problems for areas, perimeters, volumes and surface area • Solve problems for areas and circumferences of circles • Find missing parts of geometric figures using proportional reasoning and geometric relationships (Pre-Algebra) • Solve problems and express answers using appropriate units of measure • Express the rate of change as a ratio of two different measures • Select appropriate units to achieve the desired precision when solving problems
Standard IV: Students will understand concepts from statistics and apply statistical methods to solve problems. **Objective 1: Summarize, display, and analyze bivariate data.** • Collect, record, organize, and display a set of data with at least two variables. • Determine whether the relationship between two variables is approximately linear or non-linear by examination of a scatter plot. • Characterize the relationship between two linear related variables as having positive, negative, or approximately zero correlation.		

Objective 2: Estimate, interpret, and use lines fit to bivariate data. • Estimate the equation of a line of best fit to make and test conjectures. • Interpret the slope and *y*-intercept of a line through data. • Predict *y*-values for given *x*-values when appropriate using a line fitted to bivariate numerical data.		
Probability		• Determine and express the probability of an event as a fraction, percent, ratio, or decimal • Identify the probability of an event as being between zero and one. • Recognize that the sum of the probability of an event and the probability of its complement is equal to one. (Pre-Algebra • Determine whether a game or process is fair.